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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/753,507	01/08/2004	D. Amnon Silverstein	200309636-1	9854

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EXAMINER

PETERSON, CHRISTOPHER K

ART UNIT	PAPER NUMBER
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2622

NOTIFICATION DATE	DELIVERY MODE
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04/18/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/753,507	Applicant(s) SILVERSTEIN ET AL.	
	Examiner CHRISTOPHER K. PETERSON	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/19/2008 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1- 12 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. **Claims 1 -3 and 12 – 16 are rejected under 35 U.S.C. 102(a) as being anticipated by Mizukura (Japanese Patent application # 2003-284084).**

As to claim 1, Mizukura (Fig. 9 and 18) teaches an image sensing device comprising:

- a plurality of photo sensors (B, G1, R, G2) arranged in at least one array (image sensor) (Para 53), such that each of the photo sensors (B, G1, R, G2) converts incident light into an output signal, the photo sensors (B, G1, R, G2) and their respective output signals being divided into a plurality of color channels (Para 53). Mizukura teaches an image sensor with a four color light filter formed over the front of the image sensor and the four chrominance signals are output to the front end. In paragraph 54 Mizukura teaches the front end provides processing to the image data.
- a filter (B, G1, R, G2) associated with each of the photo sensors, the filters (B, G1, R, G2) selecting light within predetermined spectral bands (drawing 18) for conversion by the photo sensors into the output signals (Para 53 and 54), one color channel (G green) indicative of one color and having an associated spectral bandwidth comprising at least two color sub-channels (G1 and G2) and the filters associated with the photo sensors of the at least two color sub-channels (G1 and G2) having spectral bands within the spectral bandwidth of the one color channel wherein one of the spectral bands is narrower (G2) in bandwidth than another (G1) of the spectral bands Para (99 – 101). Mizukura shows in drawing 18 that G1 has a spectral bandwidth of 425 – 625 nm and G2 has a spectral bandwidth of 495 – 535 nm. G2 is within the bandwidth of G1.

As to claim 2, Mizukura teaches the image sensing device of claim 1 wherein the photo sensors (image sensor) are arranged in a single array and the filters (B, G1, R, G2) associated with each photo sensor (image sensor) are arranged in a mosaic of filters (B, G1, R, G2) located over the photo sensor array (image sensor) (Para 53).

As to claim 3, Mizukura teaches the image-sensing device of claim 2 wherein the mosaic of filters (B, G1, R, G2) is arranged in a Bayer pattern (Para 04).

As to claims 12 – 14, these claims differ from claims 1 – 3 only in that the claims 1 – 3 are apparatus claims whereas claims 12 – 14 are method. Thus method claims 12 – 14 are analyzed as previously discussed with respect to claims 1 – 3 above.

As to claim 15, Mizukura (Fig. 1 and 9) teaches the method of claim 14 wherein the mosaic of filter elements (B, G1, R, G2) comprises red (R), green (G) and blue (B) elements associated with red (R), green (G) and blue (B) color channels and the green color channel comprises two green sub-channels (G1 and G2) (Para 4, 53, and 54).

As to claim 16, Mizukura (Fig. 9) teaches the method of claim 15 wherein the Bayer pattern comprises alternating rows of filters a first of which includes red filters and green filters of the first green sub- channel and the second of which includes blue filters and green filters of the second green sub-channel (Para 53 and 54).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4 – 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizukura (Japanese Patent application # 2003-284084) in view of Roddy (US Patent Pub. # 20034/0160881).

As to claim 4, note the discussion above. Mizukura does not teach a beam splitter is provided which splits incident light into a plurality of paths and a separate filter/photo sensor array combination is located in each path. Roddy (Fig. 4) teaches the image-sensing device of claim 1 wherein a beam splitter (36 and dichroic mirror 32 and 34) is provided which splits incident light into a plurality of paths and a separate filter/photo sensor array combination is located in each path (30R, 30B, 30BG, 30G), there being a separate path and respective filter/photo sensor array combination provided for each color channel or sub-channel (Para 41). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a beam splitter and separate filter / photo sensor arrays as taught by Roddy to the image processing device of Mizukura, to provide a camera which could provide a signal having a fourth color that would result in an improved color gamut (Para 16 of Roddy).

As to claim 5, Roddy teaches the image-sensing device of claim 1 wherein a beam splitter (36, 32, and 34) is provided which splits incident light into a plurality of paths and a separate filter/photo sensor array combination is located in each path, there being a separate path and respective filter / photo sensor array combination provided for each color channel, and whereby the at least one of the color channels that is further

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divided into a plurality of sub-channels (30BG, 30G) is represented by a single filter/photo sensor array combination wherein a filter associated with each photo sensor of the plurality of sub-channels is arranged in a mosaic of filters located over the photo sensor array (Para 41).

As to claim 6, Roddy teaches the image sensing device of claim 1 wherein the color channels comprise red (30R), green (30G) and blue (30B) color channels and the green color channel (30G) is divided into a plurality of sub-channels, a first one of which uses a first green filter type (30G) and a second of which uses a second green filter type (30BG) having a spectral band which is narrower in bandwidth than and overlapping with the spectral band of first green filter type (Para 41 and 43).

As to claim 11, Roddy teaches the image sensing device of claim 1 wherein the color channels comprise cyan, yellow, magenta and green color channels and the green channel is divided into a plurality of sub-channels, a first one of which uses a first green filter type and a second of which uses a second green filter type having a spectral band which is narrower in bandwidth than and overlapping with the spectral band of first green filter type (Para 49 and 50). The first green channel is made up of cyan and yellow and the second one is made from cyan. Roddy also states the array can be configured in different ways.

As to claims 17 – 19 and 24, these claims differ from claims 4 – 6 only in that the claims 4 – 6 are apparatus claims whereas claims 17 – 19 and 24 are method. Thus method claims 17 – 19 and 24 are analyzed as previously discussed with respect to claims 4 – 6 above.

7. Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizukura (Japanese Patent application # 2003-284084) in view of Roddy (US Patent Pub. # 20034/0160881) as applied to claims 1 and 12 above, and further in view of Yang (US Patent # 5923380).

As to claim 7, Mizukura in view of Roddy teach the limitation “first green sub-channel”. Mizukura in view of Roddy do not teach the use of a Kodak™ Wratten™ #58 (green tricolor) filter. Yang teaches wherein the first green sub-channel uses a Kodak Wratten #58 (green tricolor) filter (Col. 7, line 23- 38). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a Kodak Wratten #58 (green tricolor) filter as taught by Yang to the “first green sub-channel” of Mizukura in view of Roddy, because the use of a known filter color, such as a Kodak Wratten color filter, the spectral sensitivity of the CCD will be known (Col. 3, line 61 – Col. 4, line 10).

As to claim 20, this claim differs from claim 7 only in that the claim 7 is an apparatus claim whereas claim 20 is a method. Thus method claim 20 is analyzed as previously discussed with respect to claim 7 above.

8. Claims 8 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizukura (Japanese Patent application # 2003-284084) in view of Roddy (US Patent Pub. # 20034/0160881) and further in view of Yang (US Patent # 5923380)

as applied to claims 7 and 21 above, and further in view of Kaplan (US Patent #6219140).

As to claim 8, Mizukura in view of Roddy and further in view of Yang teaches the limitation “second green sub-channel”. Mizukura in view of Roddy and further in view of Yang does not teach the use of a Kodak Wratten #99 (green) filter. Kaplan teaches wherein the second green sub-channel uses a Kodak Wratten #99 (green) filter (Col. 4, line 42 – Col. 5, line 12). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a Kodak Wratten #99 (green) filter as taught by Kaplan to the “second green sub-channel” of Mizukura in view of Roddy and further in view of Yang, because the use of a known color filter, such as a Kodak Wratten color filter, the apparatus will be able to compensate for spectral fluctuations (Col. 2, line 44 – 48).

As to claim 21, this claim differs from claim 8 only in that the claim 8 is an apparatus claim whereas claim 21 is a method. Thus method claim 21 is analyzed as previously discussed with respect to claim 8 above.

9. Claims 9, 10, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizukura (Japanese Patent application # 2003-284084) in view of Roddy (US Patent Pub. # 20034/0160881) as applied to claims 6 and 19 above, and further in view of Gann (US Patent #7154545).

As to claim 9, note the discussion of Mizukura in view of Roddy above. Mizukura in view of Roddy do not teach wherein the red channel is divided into a plurality of sub-

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channels. Gann (Fig. 2) teaches wherein the red channel (100 and 102) is divided into a plurality of sub-channels, a first one of which uses a first red filter type and a second of which uses a second red filter type having a spectral band which is narrower in bandwidth than and overlapping with the spectral band of the first red filter type (Col. 5, line 63 – Col. 6, line 3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided wherein the red channel is divided into a plurality of sub-channels, a first one of which uses a first red filter type and a second of which uses a second red filter type having a spectral band which is narrower in bandwidth than and overlapping with the spectral band of the first red filter type as taught by Gann to the image processing device of Mizukura in view of Roddy, because the additional spectral responses improve the spectral measurement accuracy, and increase the bit-depth, with little or no incremental cost, and with little or no negative impact on native input sampling rate or signal-to-noise (Col. 3, line 36 – 43).

As to claim 10, Gann teaches wherein the blue channel (108 and 110) is divided into a plurality of sub-channels, a first one of which uses a first blue filter type and a second of which uses a second blue filter type having a spectral band which is narrower in bandwidth than and overlapping with the spectral band of the first blue filter type (Col. 5, line 63 – Col. 6, line 3).

As to claims 22 and 23, these claims differ from claim 9 and 10 only in that the claim 9 and 10 are apparatus claims whereas claims 22 and 23 are method. Thus

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method claims 22 and 23 are analyzed as previously discussed with respect to claims 9 and 10 above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER K. PETERSON whose telephone number is (571)270-1704. The examiner can normally be reached on Monday - Friday 6:30 - 4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NgocYen Vu can be reached on 571-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CKP
4 April 2008

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/Timothy J Henn/
Primary Examiner, Art Unit 2622